PHASE II & III AFTER ACTION REPORT

BORIT ASBESTOS NPL SITE
AMBLER, PENNSYLVANIA

Prepared for:

United States Environmental Protection Agency
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FOREWORD

As mandated by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 of the *Code of Federal Regulations* (CFR), Part 300, the U.S. Environmental Protection Agency (EPA) On-Scene Coordinator (OSC) is required to provide coordinated federal response capabilities at the scene of an unplanned or sudden release of oil or hazardous substance that poses a threat to public welfare or the environment. In addition, the provisions of Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), promote a coordinated federal, state, and local response to situations whenever any hazardous substance is released or there is a substantial threat of such a release into the environment.

Conditions at the BoRit Asbestos National Priority List (NPL) Site presented a substantial threat to human health and the environment because of the potential of an uncontrolled release of a hazardous substance (asbestos) to the environment, thereby providing a legal basis for federal response activities. EPA Region III of Philadelphia, Pennsylvania, implemented the provisions of the NCP, Section 300.415.

The OSC would like to thank all agencies and individuals who provided their assistance and expertise to ensure the successful completion of Phase II and Phase III activities.

Eduardo Rovira, Jr.

On-Scene Coordinator
EPA Region III
Philadelphia, Pennsylvania

FACT SHEET (PHASE II)

REGION III
REMOVAL ACTION TDD No. E43-026-09-07-010

SITE:	BoRit Asbestos NPL Site
SIZE:	The site consists of an asbestos pile area (~ 6 acres), reservoir area (~15 acres), and park area (~11 acres), totaling 32 acres. The site also contains portions of three streams: Wissahickon and Rose Valley Creeks, and Tannery Run.
LOCATION:	Ambler, Montgomery County, Pennsylvania
APPROVAL DATES:	Original Funding Request: August 14, 2006 Increase in Funding Request: April 14, 2008 Additional Funding Request: October 15, 2009
PHASE II DATES:	July 1, 2009 - May 25, 2010
DESCRIPTION:	Under Phase II activities, the Rose Valley Creek area was cleared of vegetation. A concrete retaining wall and a stone retaining wall were constructed adjacent to the headwall. Subsequently, erosion and sedimentation control (ESC) measures began. Cable concrete mats (CCM) – 8 by 16 ft – were installed on the creek bed and stream banks. Preparation for the installation of the CCMs included grading the area, laying down geotextile fabric, and leveling the area with gravel. After the CCMs were in place, some areas were infilled with concrete; the rest of the CCMs were infilled with topsoil, hydroseeded, and covered with straw erosion control mats.
NATIONAL PRIORITIES LIST STATUS:	The site was proposed for the National Priority List (NPL) on September 3, 2008, and was listed on the NPL on April 8, 2009.
HAZARDOUS MATERIALS:	Asbestos-containing material (ACM) waste.
QUANTITIES REMOVED:	Many ACM pieces (e.g., pipes, shingles, and tiles) were in the Phase III area. During preparation of the slopes, the large pieces were collected and placed into roll-off containers for off-site disposal (approximately 69 roll-off boxes – 1,072 tons).
ON-SCENE COORDINATOR:	Eduardo Rovira, Jr.
REMOVAL CONTRACTOR:	WRScompass (WRS)
DISPOSAL LOCATION:	Cumberland County Landfill, Pennsylvania.
SITE INFORMATION:	For additional information, please visit the site's website at www.epaosc.net/BoRit.

FACT SHEET (PHASE III)

REGION III
REMOVAL ACTION TDD No. E43-026-09-07-010

SITE:	BoRit Asbestos NPL Site
SIZE:	The site consists of an asbestos pile area (~ 6 acres), reservoir area (~15 acres), and park area (~11 acres), totaling 32 acres. The site also contains portions of three streams: Wissahickon and Rose Valley Creeks, and Tannery Run.
LOCATION:	Ambler, Montgomery County, Pennsylvania
APPROVAL DATES:	Original Funding Request: August 14, 2006 Increase in Funding Request: April 14, 2008 Additional Funding Request: October 15, 2009
PHASE III DATES	March 17, 2010 - June 11, 2010
DESCRIPTION:	Under Phase III activities, erosion and sedimentation control (ESC) plans were implemented for the section of the reservoir berm parallel to Wissahickon Creek. Once the area was cleared of vegetation, a layer (of approximately 16-18 inches) of soil with mixed ACM material was placed along the slope. This first layer was covered with an additional layer (of approximately 12-15 inches) of clean fill. A third layer of topsoil (of approximately 6 inches) finalized the filling process. After that, the entire slope was hydroseeded, and straw erosion control mats were installed.
NATIONAL PRIORITIES LIST STATUS:	The site was proposed for the NPL on September 3, 2008, and was listed on the NPL on April 8, 2009.
HAZARDOUS MATERIALS:	ACM waste.
QUANTITIES REMOVED:	Under Phase III activities, no ACM was disposed of off site.
ON-SCENE COORDINATOR:	Eduardo Rovira, Jr.
REMOVAL CONTRACTOR:	WRS
DISPOSAL LOCATION:	Not applicable
SITE INFORMATION:	For additional information, please visit the site's website at www.epaosc.net/BoRit.

1.0 INTRODUCTION

This report describes activities during Phase II and Phase III at the BoRit Asbestos NPL Site (BoRit) in Ambler, Montgomery County, Pennsylvania. Phase II activities began on July 1, 2009, and were completed on May 25, 2010: Phase III activities began on March 17, 2010, and were completed on June 11, 2010.

This report includes site background information (Section 2.0); a roster of agencies, organizations, and individuals involved with each Phase (Section 3.0); resources committed (Section 4.0); Phase II design and activities (Section 5.0); Phase III design and activities (Section 6.0); challenges encountered (Section 7.0); acronyms and abbreviations (Section 8.0); and references (Section 9.0).

2.0 SITE BACKGROUND

The BoRit site consists of three adjacent properties: a property on which a pile of asbestos-containing material (ACM) is located (pile area), a property on which a water reservoir is located (reservoir area), and a park where disposal of ACM occurred (park area). The site also contains portions of three tributaries: the Wissahickon Creek, Rose Valley Creek and Tannery Run.

2.1 SITE LOCATION

The site is located at the northwest corner of the intersection of West Butler Pike and West Maple Street behind a McDonald's restaurant in Ambler, Montgomery County, Pennsylvania. The asbestos pile area and Tannery Run are within the Borough of Ambler limits; the reservoir area is considered to be in Upper Dublin Township; and the park area is located in Whitpain Township. The geographic coordinates at the approximate center of the park area are 40.1561 north latitude and 75.2306 west longitude.

The site is bordered to the north by residential properties; to the northeast and east by Chestnut Avenue, West Maple Street, and commercial and residential areas; to the south by commercial properties (McDonald's, Classic Coachworks, and Sons of Italy); to the southwest by open space owned by Montgomery County and the Pennsylvania Department of Transportation (PennDOT); and to the northwest by residential properties. A playground, Westside Tiny Tot Park, and Westside Park (basketball courts) are located to the northeast and north, respectively. See Appendix A for a Site Location Map (Figure 1) and a Site Layout Map (Figure 2).

The Ambler Asbestos Site, a former NPL site, is located approximately 1,000 feet (ft) southeast from the pile area. The NPL site was used as a disposal area by the Keasbey and Mattison Company (KMC) plant located within close proximity of the Ambler Asbestos NPL site. The EPA performed a cleanup action at the site in the early 1990s, and the site was removed from the NPL in December 1996.

Wissahickon Creek borders the site to the southwest. The approximate length of Wissahickon Creek from the northwest corner of the site (close to Mt. Pleasant Avenue) to the confluence of Rose Valley Creek is 1,550 ft, and from Rose Valley Creek to the confluence of Tannery Run is 890 ft. One dam, in a deteriorated condition, exists on Wissahickon Creek approximately 200 ft upstream from the confluence of Tannery Run. The total length of Wissahickon Creek under consideration is approximately 2,440 ft. Based on data obtained on June 10, 2008, by EPA and Tetra Tech EM Inc., (Tetra Tech), the average width of the creek is 50 ft, and the average velocity under normal conditions is 1.26 feet per second (ft/sec). U.S. Geological Survey (USGS) stream flow measurements obtained in December 2003, at the Fort Washington station during a flood occurrence, indicated a creek width of 76 ft, a cross-section area of 652 ft^2, a velocity of 5.48 ft/sec, and water height at the station gauge of 10.66 ft. Additionally, Federal Emergency Management Agency (FEMA) study information specifies a velocity measurement of 7.2 to 8 ft/sec for a 100-year flood stage. Based on the information obtained from these three sources, the velocity of the Wissahickon Creek can vary from an average of 1.26 ft/sec to as much as 10 ft/sec or higher during a major storm event.

Rose Valley Creek is located between the reservoir and the park area. The approximate length of Rose Valley Creek from Chestnut Avenue to the confluence of Wissahickon Creek is 770 ft. Based on data acquired on June 10, 2008, the average width of the creek is 15 ft, and average velocity during normal conditions is 1.2 ft/sec; however, during a major storm event, the velocity can more than double its value under normal conditions.

Tannery Run borders the BoRit site to the southeast (adjacent to the pile area) and flows to the southwest. A commercial area (McDonald's, Classic Coachworks, and Sons of Italy) is located south/southeast of Tannery Run. The approximate length of Tannery Run under consideration is 720 ft, and the average width of the creek is 13 ft. However, in one location (behind the Sons of Italy parking lot), the width of the creek is 24 ft. As measured on June 10, 2008, the average velocity of the creek is 1.3 ft/sec. However, during a storm event, the velocity is expected to more than double its value under normal conditions. The creek flows over bedrock in a general southeast to southwest direction. The

approximate elevation difference between the two ends of the creek adjacent to the site is 10 ft. The bedrock drops approximately 4 ft in the area behind Classic Coachworks. Close to the McDonald's parking lot, the south bank of Tannery Run is approximately 10 ft high. Behind the Sons of Italy parking lot, the south bank is approximately 20 ft high.

2.2 SITE HISTORY

KMC manufactured asbestos products in the Borough of Ambler from the late 1800s until the facility was sold to Nicolet, Inc., and CertainTeed Corporation in the early 1960s. Both Nicolet, Inc. and CertainTeed Corporation continued to manufacture ACM. Asbestos waste from the manufacturing process was dumped in the areas described below.

2.2.1 Pile Area

The pile area is a 6-acre parcel located at the northwest corner of West Maple Street and Tannery Run. ACM waste from the KMC facility was disposed of at the parcel, creating the asbestos pile now approximately 20 to 25 ft above the surrounding ground surface.

Comparison of aerial photographs from various years suggests that KMC began waste disposal at the pile portion of the BoRit site during the 1930s. Asbestos waste disposal appears to have continued until the 1960s. Reportedly, this area primarily received slurry of spent magnesium and calcium carbonate, as well as waste products from the manufacture of asbestos pipe, insulation, sound dampeners and ceiling/roof tile. The berms around the pile appear to have been constructed of asbestos shingles and soil. Based on aerial photographs between 1970 and 1973, the pile was covered with vegetation. The site was first fenced in the mid-1980s. For short periods of time in the 1980s and 1990s, portions of the pile area were used as a trash transfer station or trash storage location, and for fire fighting training. During this period, the pile appears to have been vegetated. Asbestos waste is visible on the surface in several locations. A two-dimensional electrical survey estimated the volume of the pile to be 149,500 cubic yards.

2.2.2 Reservoir Area

The 15-acre reservoir area, located north-northwest of the pile, was used by the KMC plant for storage of process and fire water. Water from the reservoir was carried to the plant through a metal pipe, which is still visible in Tannery Run (behind the McDonald's). The banks of the reservoir are suspected to be constructed of ACM waste (asbestos shingles, millboard, and soil) from the KMC plant.

The reservoir is present in a 1937 aerial photograph and likely was in place before this date. ACM waste may lie on portions of the reservoir bottom. The Wissahickon Valley Waterfowl Preserve (WVWP), a local conservation group, wants to keep the reservoir as a natural habitat and is planning to construct a viewing platform along West Maple Street for the general public to enjoy the fauna.

2.2.3 Park Area

The Whitpain Wissahickon Park (park area), located northwest of the existing reservoir property, also received ACM waste from the KMC plant. The 11-acre park is triangular in shape.

The park area reportedly received out-of-specification asbestos manufacturing products and other solid wastes. It is not clear when disposal activities began in this area. However, aerial photos indicate disposal may have started as early as 1937. Aerial photographs suggest that waste disposal ceased in the mid 1960s, when the pile was covered with soil. A 1970 aerial photograph shows a baseball diamond in the park. The park has been officially closed for public access for more than 20 years. The local community and other interested parties would like to see the park reopened for public use.

2.3 PREVIOUS SITE INVESTIGATIONS AND ACTIVITIES

This section describes previous site investigations and activities at the pile area, the reservoir area, and the park area, and in the portions of the three tributaries within the BoRit site (Wissahickon and Rose Valley Creeks, and Tannery Run).

2.3.1 Asbestos Pile Area

In 1984, the Pennsylvania Department of Environmental Protection (PADEP – previously known as the Pennsylvania Department of Environmental Resources [PADER]) – collected samples from the pile; all samples contained asbestos. PADEP issued a notice of violation to Nicolet, owner of the pile property at the time, for not complying with the asbestos waste disposal regulations. In 1984, the pile was determined by PADEP to be inadequately covered, and no warning signs were posted on the property. PADEP directed Nicolet to cover the pile with 6 inches of compacted material (clay/soil) and vegetation or cover it with 2 ft of compacted material; post warning signs; and construct a fence around the pile. In response to these directives, Nicolet constructed a fence along the eastern portion of the property along West Maple Street to control access. Available information does not indicate whether the pile was covered at the time or signs were posted.

On March 30, 1984, EPA's contractor, the NUS Field Investigation Team (FIT) 3, conducted a preliminary assessment of the pile. A small trash transfer station was located on the property, and the asbestos pile was covered with vegetation.

On October 27, 1987, NUS FIT 3 conducted a Site Investigation (SI) of the pile area. Seven soil samples were collected from the pile and surrounding areas, three water samples were collected from Tannery Run, and two water samples were collected from the Wissahickon Creek. The soil samples contained up to 22% total asbestos. The water samples results ranged from non-detect to 2.5 million fibers per liter (MFL). The maximum contaminant level (MCL) for asbestos in drinking water is 7.0 MFL.

Observations during the 1987 SI indicated that individuals were using the pile area for unauthorized disposal of household wastes. In addition, although about 95% of the pile area was covered with heavy vegetation, there were small areas with no vegetation, and six abandoned vehicles were located on-site. Runoff from the pile area entered Tannery Run. The pile measured 2 acres in areal extent, and the height of the pile was approximately 25 ft above the surrounding grade. Four empty 55-gallon drums were located in the reservoir north of the pile, and asbestos shingles were observed on the ground throughout the property (NUS 1988). It is unknown whether the drums were floating or were stuck at the bottom of the reservoir.

In April 2006, an EPA Site Assessment Group conducted a baseline sampling event at the site. Results from the sampling event showed the presence of asbestos in air, soil, surface water, and sediments. ACM was visible throughout the entire site (Tetra Tech 2006).

2.3.2 Reservoir Area

In June 2004, a Phase I Environmental Site Assessment (ESA) was conducted in the 15-acre water reservoir area by O'Brien & Gere for the Wissahickon Valley Watershed Association (WVWA). The ESA identified non-friable ACM along the banks of the water reservoir that included asbestos shingles, millboard, and soil. ACM was also observed within the reservoir. Asbestos-containing cement pipe sections and various other types of ACM were scattered around the banks of the reservoir and along Rose Valley and Wissahickon Creeks. ACM observed near the reservoir consisted of transite, a mixture of cement and asbestos. These materials are generally non-friable; however, it was observed that the

transite was beginning to degrade and become friable at the weathered ends of the material (O'Brien & Gere 2004).

The Phase I ESA included collection of reservoir water, sediment, waste, soil, and air samples. The reservoir water and sediment samples were analyzed for metals, volatile organic compounds (VOC), and semi-volatile organic compounds (SVOC). The samples were not analyzed for asbestos. No significant concentrations of contaminants were detected in the samples. Gray-white soil or soil-like material in 5- to 10-square-foot patches was observed on the east side of the reservoir. A sample of this material was collected and the analysis indicated a 30% chrysotile asbestos concentration. The same gray-white material was observed below the vegetation around the reservoir. Three samples of this material were collected and the analysis indicated a 20 to 25% chrysotile asbestos concentration. Two air samples from downwind of the reservoir were collected during a period of 2.5 hours. The air samples were analyzed using phase contrast microscopy (PCM) and contained 0.0004 asbestos fibers per cubic centimeter (fibers/cc) (O'Brien & Gere 2004). Although PCM method of analysis is not generally used when evaluating public exposure to airborne asbestos, this value is below the Occupational Safety and Health Administration's (OSHA) permissible exposure limit (PEL) (0.1 fibers per milliliter (fiber/mm) – 8-hour time-weighted average [TWA]); below EPA's limit for schools after indoor asbestos remediation (0.01 fibers per cubic centimeter); and within the range of reported airborne asbestos PCM values for urban areas (10^{-8} to 10^{-4} fibers/mm – levels in urban areas may be an order of magnitude higher than those in rural areas). (Agency for Toxic Substances and Disease Registry [ATSDR] 2001).

It should be noted the preferred method for analyzing air samples for asbestos for human health risk assessment purposes is transmission electron microscopy (TEM). PCM cannot detect fibers below 0.20 to 0.30 micrometer (μm) in diameter, but TEM is capable of detecting fibers with a diameter as small as 0.01 μm; therefore, the PCM method may underestimate the actual asbestos concentration.

In March 2005, three surface soil samples were collected analyzed for polychlorinated biphenyls (PCB) from beneath a pole-mounted transformer located near the southern corner of the water reservoir. No PCBs were detected. In addition, three surface soil samples were collected and analyzed for polynuclear aromatic hydrocarbons (PAH) near a discarded metal storage tank. The soil samples contained the following PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. The levels found do not pose a threat to human health and/or the environment. The detected compounds are

common components of heating oil and petroleum-based products, and may be formed by incomplete combustion of some fuels. Three sediment samples were collected and analyzed for asbestos from the bottom of the reservoir, and one sediment sample was collected and analyzed for asbestos from the outflow of the reservoir. Asbestos was not detected in any of the four sediment samples (Tetra Tech 2006).

2.3.3 Park Area

In response to public concerns, EPA's Removal Program collected two soil samples from the park area in December 1983. Results for both samples revealed chrysotile asbestos ranging from 10 to 15%. EPA collected 24 surface soil samples from the park and three soil samples from areas adjacent to the park in October 1984. Of the 24 samples, five contained approximately 1% chrysotile asbestos and one contained less than 1%. One of the three off-site samples contained 1% asbestos. No asbestos fibers were detected in the other 20 samples (Tetra Tech 2006).

In December 1984, EPA collected seven on-site vacuum samples from the park surface. No asbestos fibers were detected using PCM analyses. In addition, soil core, surface soil, and vacuum samples were collected from seven nearby yards and roads adjacent to the yards. For comparison, two background samples from Fort Washington State Park were collected. Chrysotile asbestos fibers were found (using TEM analyses) in several of the samples from both the nearby yards and Fort Washington Park locations. Public health officials concluded that the asbestos levels present in the yards could not be differentiated from background area locations (Tetra Tech 2006).

In July 1996, EPA and PADEP collected 96 soil samples, including both surface and subsurface samples (down to 14 inches below ground surface) from the park. Results revealed asbestos in all but six samples (using PCM and TEM analyses). Amosite asbestos was detected in six samples and chrysotile in 86 samples. Asbestos concentrations ranged from trace to 15%. Generally, the higher %age values were found at depth.

Between July 8, 2008, and June 30, 2009, as part of Phase I Removal activities, approximately 8,400 square yards of park area was cleared and approximately 2,000 yards of approach roads was constructed at the park. Once the site was cleared and the approach roads were constructed, erosion and sedimentation control (ESC) measures were implemented for the east bank of the Wissahickon Creek (adjacent to the park). Those activities included: preparation of the slope; placement of geotextile

fabric on the slope; installation of Geocells; infilling of Geocells with stone and/or topsoil; placement of rip-rap along the water's edge; hydroseeding of the slope; and placement of an erosion control mat over the seeded area. Summarizing all activities on-site during the Phase I actions, an After Action Report for the Borit Asbestos NPL Site, was prepared by Tetra Tech, Boothwyn, Pennsylvania; and submitted to EPA on March 1, 2010.

2.3.4 Removal and Site Assessments

On April 20 and 27, 2006, Tetra Tech collected air, soil, surface water, sediment, and waste samples from the site. Only two soil samples were collected from the park. The results for both samples indicated that the soil from the park area contained asbestos. The trip report for the April 2006 sampling event indicated that all air samples contained detectable asbestos fibers; however, the analytical data as presented did not allow a reliable determination of health risks or comparison to a health-based standard for asbestos.

Four of the six air samples were found overloaded with dust/particles. The analytical technique used to analyze such samples is not the preferred method when results are to be used to perform risk analyses. Values ranged from 0.00061 to 0.039 (f/cc). The higher values were significantly above "typical" background levels for urban areas (0.0001 f/cc) and approached the occupational PEL.

Asbestos fibers were detected in five surface soil samples and four waste samples collected from the pile and park areas. Asbestos fibers were also detected in both the upstream and downstream sediment samples collected from Wissahickon Creek. Asbestos fibers were not detected in the surface water samples collected from Wissahickon Creek, but were detected in one of the surface water samples collected from the reservoir (Tetra Tech 2006). Results prompted referral to EPA's Removal Program.

From October 2006 to September 2007, EPA's Removal Program collected a total of eight rounds of air samples at and around the BoRit site. Approximately 382 samples were collected and analyzed by TEM. Some of those rounds included activity-based sampling (ABS). During ABS, personnel wore personal air sampling pumps while conducting physical activities such as soil sample collection, hiking, brush cutting, and raking. The air samples were collected and analyzed using methods recommended by the EPA Asbestos Technical Review Workgroup (TRW). The detection limits set were 0.0005 f/cc for stationary pumps and 0.003 f/cc for personal pumps.

Asbestos fibers were counted from approximately 382 samples by several means. Use of the Phase Contrast Microscopy Equivalency (PCME) method of counting asbestos fibers (ordinarily used to determine airborne health risk) yielded a detection at only one off-site sampling location (May 2007). The sampling station was located on an industrial facility property, and the result was 0.00049 f/cc. Stationary samplings located at the perimeter of the site or on-site resulted in six positive PCME results ranging from 0.00048 to 0.00098 f/cc. The highest result was recorded at a station in the park in September 2007, the driest month during the sampling period. The ABS raking scenarios on both the pile and park resulted in personal air sampler concentrations of 0.021, 0.012, and 0.0058 f/cc by PCME; the highest result was found for a sample collected when raking along the Wissahickon Creek bank adjacent to the park. These ABS results are well above 0.0009 f/cc (PCME), which is the value calculated to present a $1x10^{-4}$ cancer risk at the World Trade Center.

Only PCME results are routinely used by EPA to determine airborne health risks. Nonetheless, it is recognized that the shorter fibers captured by the Asbestos Hazards Emergency Response Act (AHERA) counting method may play a role in increased potential for non-cancer health effects (e.g., pulmonary fibrosis). Of the 382 samples, 75 detections occurred using the AHERA (fiber length > 0.5 µm) counting method, the majority at or near the analytical detection limit. Out of the 75 detections, 18 were off site (<0.0005 to 0.005 f/cc), 44 were on-site or at the perimeter (<0.0005 to 0.0029 f/cc), two were in the nearby town (0.0005 to 0.005 f/cc), and 11 were ABS (0.0029 to 0.076 f/cc). Health threats from asbestos exposure are generally presented in terms of cancer risk because limited information is available to quantify non-cancer risks from asbestos.

3.0 ROSTER OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS

This section describes the roles, names and contact information of the primary agencies, organizations, and key individuals involved in Phase II and Phase III of the Removal Action, and illustrates the organization of the response.

3.1 FEDERAL AGENCIES

U.S. Environmental Protection Agency (EPA)

EPA was the lead agency. On-Scene Coordinator (OSC) Eduardo Rovira, Jr. was the project manager for the site. OSC Jack Kelly, a member of the TRW, dealt with the air sampling methods, lab analysis, and interpretation. EPA toxicologist Dawn Ioven provided the risk calculations.

Francisco J. Cruz was the Community Involvement Coordinator (CIC) from the beginning of Phase II until April 1, 2010, when Vance Evans took over as CIC. Megan Mackey was the State Liaison for the site. She kept all the elected officials informed of site activities.

Phil Campagna, with EPA's Environmental Response Team (ERT), managed the air monitoring and sampling contract, and James Wright was the EPA's assigned field accountant for the site.

Agency for Toxic Substances and Disease Registry (ATSDR)

Senior Regional Representative Lora Werner and toxicologist Karl Markiewicz assisted the OSCs with asbestos sampling methods, lab analysis, and interpretation.

U.S. Army Corps of Engineers (USACE)

USACE, in coordination with EPA's Superfund Technical Assessment and Response Team (START) contractor (Tetra Tech), worked on the design and implementation of the Erosion and Sedimentation (E&S) control plans. Richard DePasquale was the engineer assigned to the site.

3.2 STATE AND LOCAL AGENCIES

Pennsylvania Department of Health (PADOH)

Montgomery County Health Department (MCHD)

The OSC kept his counterparts at PADOH and MCHD apprised of the activities at the site. The PADOH and MCHD representatives assigned to BoRit were Barbara Allerton and Harriet Morton, respectively.

Pennsylvania Department of Environmental Protection (PADEP)

Although EPA was the lead agency, the OSC had to comply with all of the State's Applicable or Relevant and Appropriate Requirements (ARAR); therefore, the OSC kept his counterparts at PADEP apprised of the activities at the site. PADEP representatives Abdel Nassani and Tim Cherry were associated with the site during the Phase II and Phase III activities.

Whitpain Township

Most activities during Phase II took place on Township property. The OSC kept in constant communication with Township officials.

Wissahickon Valley Waterfowl Preserve (WVWP)

Some activities during Phase II took place on WVWP property. The OSC kept in constant communication with David Froehlich, WVWP representative.

3.3 EPA CONTRACTORS

WRScompass (WRS)

WRS was the main Emergency and Rapid Response Services (ERRS) contractor for the site and performed the actual implementation of the design. During the Phase II and Phase III portions of the Removal Action, the following subcontractors to WRScompass conducted the tasks listed below:

- County Line Fence: Installed/removed fence around the pumps on Chestnut Alley and removed/installed fence by South gate, along Chestnut, and going up the reservoir berm.
- Strobert Land Clearing Services, Inc.: Performed clearing and grubbing activities and ground the vegetation.
- Godwin Pumps: Provided and maintained the pumps required to re-route Rose Valley Creek stream flow during the Phase II activities.
- Ply-Mar Construction: Repaired damaged 5-foot-diameter Corrugated Metal Pipe (CMP) adjacent to the Rose Valley Creek headwall.
- Anthony Biddle: Performed concrete work at the headwall area.

Tetra Tech EM Inc. (Tetra Tech)

Tetra Tech, under the START contract, provided contractor oversight and engineering support to EPA. During the Phase II and Phase III portions of the Removal Action, Tetra Tech oversaw subcontractor Ludgate Engineering's topographic survey of the entire site, cross-sectional survey of the Rose Valley Area, sounding survey near the head-wall (to locate reservoir depth), and post-construction survey of the Phase II and Phase III areas.

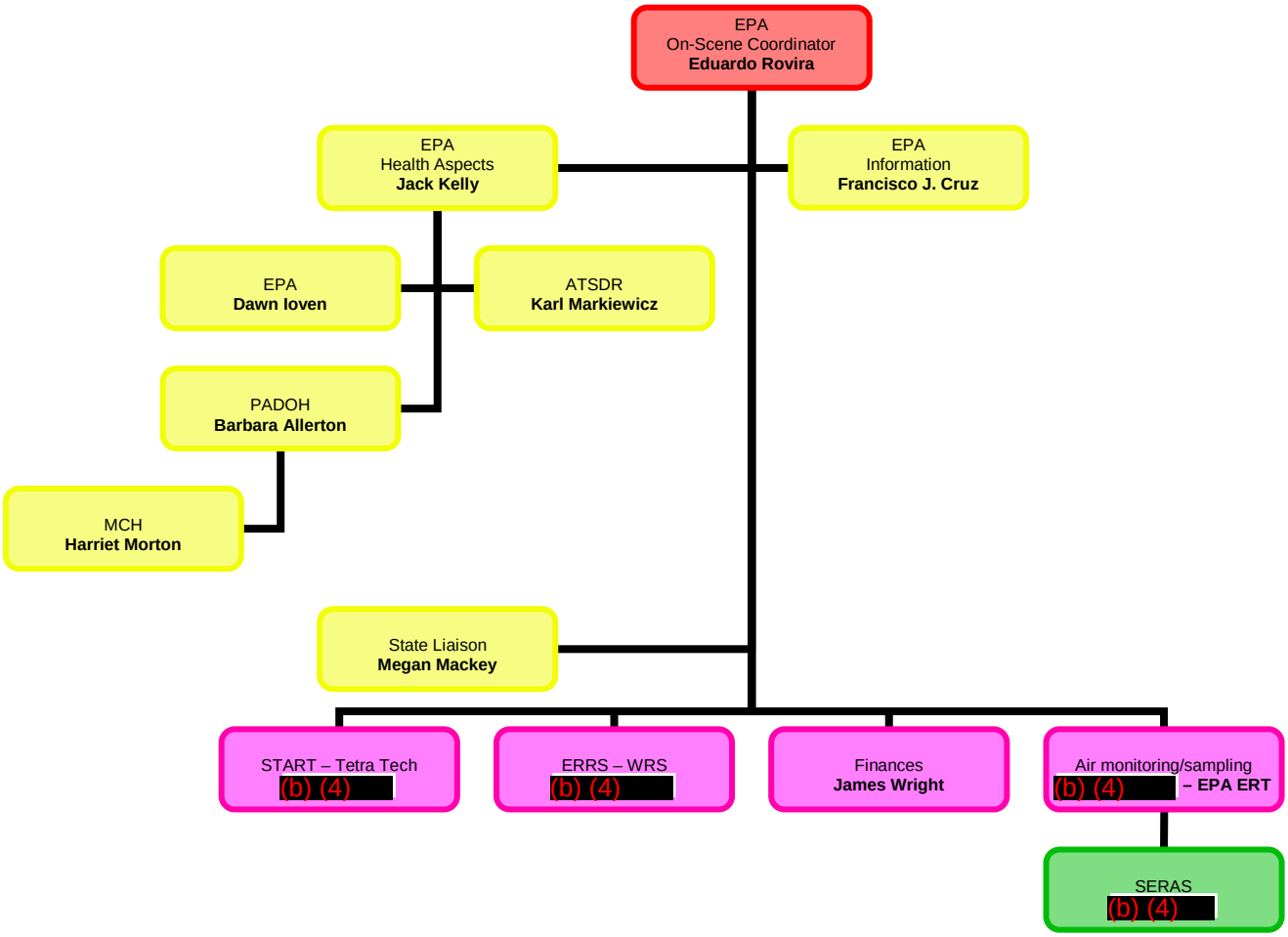
Lockheed Martin

Under the Scientific Engineering Response and Analytical Services (SERAS) contract, Lockheed Martin conducted all the air monitoring and sampling at the site during Phase II. From SERAS, Joe Brandine was assigned to the project.

3.4 NAMES AND CONTACT INFORMATION

AGENCIES	CONTACTS	PHONE NUMBERS	DUTIES
EPA	Eduardo Rovira	(215) 654-5190	OSC
	Jack Kelly	(215) 654-5190	OSC
	Francisco J. Cruz	(215) 814-5528	CIC (Nov. 2008 to Apr. 2010)
	Vance Evans	(215) 814-5528	CIC (Apr. 2010 to present)
	Dawn Ioven	(215) 814-3320	Toxicologist
	James Wright	(215) 814-3250	Finance
ATSDR	Lora Werner	(215) 814-3141	ATSDR Representative
	Karl Markiewicz	(215) 814-3149	ATSDR Toxicologist
PADOH	Barbara Allerton	(717) 346-3283	PADOH Representative
MCHD	Harriet Morton	610-278-5117	MCHD Representative
EPA ERT	Philip Campagna	(732) 321-6689	Air Sampling
Lockheed Martin (SERAS)	(b) (4) s	(732) 494-4008	Site Lead
	(b) (4)	(516) 993-0400	SERAS Member
USACE	Richard DePasquale	(215) 656-6675	Engineer
PADEP	Abdel Nassani	(484) 250-5170	Dam Safety and Waterway Management Program
	Tim Cherry	(484) 250-5728	Environmental Cleanup Program
	Linda Rebarchak	(484) 250-5820	Community Relations Coordinator
Tetra Tech	(b) (4)	(215) 651-4021	START – Site Lead
	(b) (4)	(732) 513-0551	START – Health & Safety Officer
Ludgate Engineering	(b) (4)	(610) 404-7330	START/Site Surveys
WRS	(b) (4)	(215) 654-5191	Response Manager (from 09/26/08)
	(b) (4)	(312)-617-9834	Project Superintendent
	(b) (4)	(813) 436-7079	Project Accountant

3.5 ORGANIZATION OF THE RESPONSE



4.0 RESOURCES COMMITTED

This section describes the initial and additional funding requests and total costs for the Phase II and III activities at the site.

4.1 INITIAL FUNDING

On August 8, 2006, the EPA OSC conducted a removal site evaluation pursuant to Section 300.140 of the NCP. On August 14, 2006, after reviewing the air sampling results obtained by EPA's Site Assessment Program, and evaluating factors specified in Section 300.415 of the NCP, the OSC initially determined that site conditions posed a potentially significant threat to public health, welfare, or the environment, and initiated immediate response activities pursuant to Section 104 of CERCLA to mitigate the threat. Pursuant to Re-Delegation of Authority 14-2, the OSC authorized the expenditure of CERCLA funding in an amount not to exceed $250,000 to initiate an emergency Removal Action intended to cover exposed areas of ACM on the site surface and conduct sampling to determine the threat posed by airborne asbestos levels.

4.2 ADDITIONAL FUNDING SUMMARY

After the removal assessment had been completed and analytical air results had been obtained, additional funds and exemption from the $2 million and 12-month statutory limit for a Removal Action at the BoRit site were requested by the OSC; this request was approved by the Hazardous Site Cleanup Division Director on April 14, 2008. On October 15, 2009, the Division Director signed a second Request for Additional Funding for the Removal Action at the site. The OSC requested additional CERCLA funding in the amount of $4,862,820 above the $250,000 already authorized by the OSC pursuant to Delegation of Authority 14-2 and the $4,499,560 already authorized by the Director of the Hazardous Site Cleanup Division. This funding established an estimated Removal Project Ceiling of $9,612,380.

5.0 PHASE II DESIGN AND ACTIVITIES

5.1 EROSION AND SEDIMENTATION CONTROL (ESC) DESIGN

The purpose of stabilizing the Rose Valley Creek area and reservoir berm parallel to the creek was to minimize and/or prevent erosion and resultant release of asbestos from those areas.

The design and implementation of Phase II included the following stages: (1) construction of a ramp across Rose Valley Creek from the park area; (2) construction of a 104-foot-long stone retaining wall; (3) construction of a 6-foot-long reinforced concrete retaining wall (an extension of the existing Rose Valley creek culvert/headwall near the south gate to the park area); (4) stabilization of 600 ft of park side slope; (5) stabilization of 800 ft of reservoir side slope; (6) stabilization of 550 ft of the sewer road; and (7) stabilization of 550 ft of Rose Valley Creek banks and bed with CCMs.

Between August 10 and 17, 2009, trees along the banks of Rose Valley Creek and the reservoir bank were cleared by Strobert Land Clearing Services, Inc.

A decision to work "dry" in the creek necessitated diversion of the creek water. On September 17, 2009, two 2,600-gallons-per-minute capacity pumps were installed to divert the creek water. The pumps were installed in the sluiceway "on the other side" of Chestnut Alley. The flow was discharged to the Wissahickon Creek through an 18-inch-diameter, 700-foot-long, high density polyethylene (HDPE) pipe. For the normal stream flow, one pump was sufficient to divert the creek water; however, the second pump was kept as a stand-by to handle any unexpected increase of flow in the creek (such as would result from a storm event). The two pumps were shut down and dismantled on March 2, 2010, when all construction activities related to the creek side slopes and the streambed had been completed.

Construction stages were as follows:

5.1.1 Rose Valley Creek Ramp

On July 15, 2009, construction of a ramp to cross Rose Valley Creek (at the southwest corner of the park area) began. The ramp was necessary to transport materials and equipment to the other side of the creek for Phase II and subsequence phases. Twelve 48-inch-diameter pipes, each 20 ft long, were used in three rows, side by side, making an 80-foot ramp at the creek. Construction of the ramp finished on August 27, 2009.

5.1.2 Stone Retaining Wall

Construction of an original stone retaining wall started on October 6, 2009. The 104-foot-long stone wall is located at the east side of the headwall, next to the reservoir bank. The wall is made of stone blocks each approximately 4 ft long (facing the creek), 3 ft deep (perpendicular to the creek), and 1.5 ft high. The height of the wall is 9 ft, of which 1.5 ft lies below the grade over a 3-inch-thick stone (# 57 stone) bed. The area behind the wall was filled with # 57 stone placed on a 10-ounce, non-woven, geo-

textile fabric. Construction of the original stone retaining wall was completed on October 26, 2009. However, due to heavy rain, the base of the wall was damaged; as a result, the OSC decided to dismantle the wall and reconstruct it with an extra layer of buried stone blocks (as a new base) to provide a stronger foundation and prevent a recurrence of the damage during another storm event. For extra reinforcement, the base area was concreted in. The wall was dismantled from November 2 to 4, 2009, and was rebuilt from November 4 to 11, 2009.

5.1.3 Reinforced Concrete (RC) Retaining Wall

The 24-inch-thick RC wall was constructed on a 12-inch-thick RC slab foundation. The wall is located at the western end of the Rose Valley Creek headwall. The length of the wall is 6 ft and the height is 4 ft above the base slab. Reinforcement bars of 0.5-inch diameter were used vertically and horizontally at a distance of 1 foot center to center. The construction of the RC retaining wall, including the base slab, started on November 17, 2009, and was completed on November 19, 2009.

5.1.4 Park-Side Slope

The park-side slope extends from the north side of the Rose Valley Creek ramp to the south gate along Chestnut Avenue. The approximate length of the park-side slope is 600 ft, and the average width is 16 ft (measured along the slope), making the entire park-side slope area approximately 9,600 square ft. The area was first cleared of large pieces of ACM and miscellaneous debris (including tree roots and small vegetation). To construct a uniform slope, the entire area was covered with 10 to 12 inches of clean fill followed by a 2- to 3-inch layer of topsoil and hydro-seeding. The area was further covered with a layer of a heavy-duty erosion control mat (Propex – Armormax™). Including overlapping and waste, approximately 11,500 square ft of Propex was placed along the park-side slope. A thin layer (less than 1 inch) of mulch material (seeded erosion control blanket) was sprayed over the Propex.

5.1.5 Reservoir Side Slope

The reservoir side slope extends from behind a residential property up to the confluence of the Wissahickon and Rose Valley Creeks. The entire length of the slope is approximately 800 ft; however, the width of the slope varies from 8 ft (at the north end) to 18 ft (south end), making the entire slope area approximately 10,400 square ft.

Once the area had been cleared of vegetation, large pieces of ACM and debris were removed. Due to concerns regarding the integrity of the reservoir berm, the tree stumps were not removed from the slope. To provide a uniform slope for the construction, the entire reservoir berm area was covered with a 10- to 12-inch-thick layer of clean fill and compacted, as necessary. A final layer of topsoil was placed over the clean fill, followed by hydro-seeding and a straw erosion control mats. Approximately 12,000 ft^2 of straw mats were used to cover the entire reservoir bank slope.

5.1.6 Construction of Sewer Road

This 550-foot-long sewer road originates from the south gate to the park area along Chestnut Avenue and ends at the confluence of the Rose Valley and Wissahickon Creeks along the west side of the Rose Valley Creek. The sewer road was originally planned for use by the Whitpain Township Sewer Department to approach the four sewer manholes located along the west side of Rose Valley Creek. However, over the course of time, the road became covered with tall trees and bushes that made it inaccessible. Once the EPA began construction in preparation for Phase II of the Removal Action, the area was cleared of tall trees, vegetation, and large pieces of ACM debris.

When the road surface had been cleared, fabric and #57 stone were placed to strengthen the surface area. Initially, the road width varied from 10 ft (close to Chestnut Avenue) to 9 ft (close to the third manhole, as measured from Chestnut Avenue). In some areas, the width of the road was increased using clean fill. Once the road was stable enough, CCMs were placed over a base of geo-textile fabric. The final step of the construction involved filling the CCMs with topsoil, followed by hydro-seeding. A total of approximately 7,300 square ft of CCM, 400 cubic yards of stone (#57), 150 cubic yards of clean fill, and 8,000 square ft of fabric was used to construct the road. After construction activities were completed, the road width measured approximated 11 ft (average).

5.1.7 Rose Valley Creek

The length of Rose Valley Creek from Chestnut Avenue to the confluence with the Wissahickon Creek is approximately 775 ft, but the length of the creek considered for reconstruction under Phase II was approximately 550 ft, starting from the headwall to the pipe inlet on the north side of the ramp over Rose Valley Creek. The creek enters the site through a concrete culvert that runs beneath Chestnut Avenue and is approximately 10 ft wide and 4 ft high. Two 5-foot-diameter CMPs, which run parallel to the concrete culvert, also enter the site and discharge water to the creek during rain or storm events.

Various options to provide erosion and sedimentation control were considered. However, use of CCMs along the side slopes and the streambed was finally considered suitable for the work. The design called for the side slope to incline at approximately 45 degrees, the slope of the centerline of the creek bed to decrease in elevation by 0.58 ft over a distance of 100 ft (from headwall to the confluence with the Wissahickon Creek), and the width of the streambed (beyond the stone retaining wall) to be 17 ft.

After the area had been cleared of vegetation and the ACM debris had been picked up, the surface was covered with approximately 6 to 12 inches of clean fill to prepare a relatively smooth surface in order to implement the design. To place the CCMs over the streambed (bed rock) and to maintain a constant slope of 0.58 ft per 100 ft from headwall to the confluence of Wissahickon Creek, the cut and fill technique was followed throughout the construction process. As a result, some portions of the streambed were excavated, but fill material was used to maintain the slope in other areas. For approximately 200 ft upstream from the Rose Valley ramp, very soft material (silt and mud) was encountered to a depth of up to 36 inches. The unstable soft material, as well as any ACM encountered, were excavated from the creek bed and staged in piles at the Rose Valley flood plain along the reservoir bank. The excavated area was filled with R4 riprap and #57 stone. To maintain the proper slope, installation of the CCMs started from the headwall area and progressed gradually downstream.

Approximately 27,000 square ft of CCMs, 35,000 square ft of geo-textile fabric, 350 cubic yards of #57 stone, 900 cubic yards of clean fill, and six truck-loads of R4 riprap were used for the reconstruction of the creek sides and bottom.

The creek changes direction at four bend points (BPs). At those four BPs, the CCMs were filled with concrete. The CCMs on the creek bed were infilled with #57 stone, while the CCMs along the stream banks were infilled with topsoil. Once the topsoil was in place, the area was hydro-seeded, and erosion control mats were installed.

Description of CCMs

CCMs come in different sizes, shapes, and weights depending on design requirements. CCMs used at the Rose Valley Creek area were supplied by Bethlehem Pre-Cast Inc., of Bethlehem, PA.

Type	CC45
Sizes	16 by 8 ft or 16 by 4 ft per section

Contains	72 blocks (size 16 by 8 ft each) or 36 blocks (size 16 by 4 ft each) per section
Each Block	15.5 by 15.5 inches at the bottom and 11.5 by 11.5 inches at the top, with a variable height. For the CC45, the height of each block is 5.5 inches.
Spacing	At the base of each block 0.5 inch, and at the top, 4.5 inches
Weight	Each block weighs 80 pounds (lbs), making the weight of each 16- by 8-foot block about 5,760 lbs.
Connection	All blocks were connected with a 1/8-inch-diameter steel cable. All mats were connected to adjacent mats using steel cable clamps.
Area covered	Approximately 34,816 square ft.

5.2 CHRONOLOGY OF FIELD ACTIVITIES

June 2009 to September 2009

In late June and early July of 2009 the EPA and contractor representatives met with various interested parties, including local residents, the Delaware Valley Basin Commission, and the WVWP to discuss design aspects of the Removal Action to be performed along Rose Valley Creek and Tannery Run. The main focus of this discussion was nature preservation during construction. A site tour was conducted to mark trees that the EPA would attempt to save during the upcoming bank clearing operations. During the site tour the WVWP representative also discussed remediation of the reservoir area with the EPA and expressed concern about the stability of the reservoir bank close to the headwall of Rose Valley Creek during excavation activities (located near the south gate to the park area). During August 2009, the EPA OSC met again with the WVWP representative to discuss revisions to the design for the Rose Valley Creek and reservoir bank areas.

Between July 15, 2009, and August 27, 2009, ERRS constructed the ramp and crossing over Rose Valley Creek in order to access the reservoir side of the creek. Construction of the ramp included the following: removal of ACM debris from the streambed beneath the crossing; installation of three 80' long by 48" in diameter CMPs to allow the stream to flow beneath the crossing (each CMP consisted of four 20 ft sections); and placement and compaction of clean fill (and stone where needed) to create the ramp from the southwest corner of the park area to the floodplain on the reservoir side of the creek.

On August 2, 2009, a severe storm swept over the Ambler area; approximately 3 inches of rain fell in a short period of time which caused heavy localized flooding. As a result, the water flowing within Rose

Valley Creek exited the concrete sluiceway (across Chestnut Avenue) and knocked down the south gate to the site. A fence subcontractor was on-site to replace the south gate between August 7 and 10, 2009.

During the week of August 10, 2009, a tree cutting subcontractor was on-site to clear the vegetation along the reservoir berm and the floodplain by Rose Valley Creek; during this week, the Response Engineering and Analytical Contract (REAC) contractor resumed daily air monitoring and weekly air sampling for asbestos. All clearing and grubbing operations (including grinding) were completed by August 17, 2009, and all pieces of equipment were decontaminated and demobilized by August 19, 2009. While on-site, one of the tree clearing machines went over the 5 ft storm water pipes by the headwall, which caused one of the corrugated metal pipes to be damaged by the weight of the machine. The EPA OSC informed Whitpain Township, and a Township representative arrived on the scene shortly afterward to discuss the best way to repair the damage. On September 3, 2009, a subcontractor replaced the damaged section of the pipe, and final backfilling of the area was completed on September 8, 2009.

In September 2009, flyers were distributed to local residents along West Maple Street and Railroad Avenue informing them of an upcoming closure for a portion of Chestnut Avenue (adjacent to the south gate to the site). The temporary road closure (for the next several months) was performed in order to re-route Rose Valley Creek while the Phase II bank stabilization work was underway.

On September 15, 2009, two high-capacity pumps were delivered to the site. The pumps were set up by the Rose Valley Creek sluiceway, across from the south gate. As stated above, the pumps were used to dewater the creek during the Phase II activities. On September 17, 2009 the pumps installation was completed and the diversion of the stream flow around the work area began.

In late September 2009, EPA's contractor began to survey and lay out control points and sections along Rose Valley Creek to prepare for installation of the CCMs. Subsequently, the design team met to review the survey work and layout control points and sections along the Phase II work area, review the progress of excavation along the Rose Valley Creek streambed, and further discuss finalization of the Phase II Removal Action.

Other activities that occurred in late September 2009 included hydroseeding along the top and slope of the reservoir berm adjacent to the floodplain (after earlier placement of approximately 8 inches of clean

fill and 4 inches of topsoil). Following the hydroseeding, straw erosion control mats were installed to prevent erosion and promote vegetation growth, which would stabilize the berm.

October 2009 to December 2009

Between October 6 and October 26, 2009, the contractor completed construction of the concrete block retaining wall adjacent to the Rose Valley headwall. The wall was five blocks high and approximately 52 ft long (4 ft behind the headwall and 48 ft past the headwall).

Between October 9 and October 14, 2009, the contractor completed removal of soil and ACM from the upper banks of Rose Valley Creek (park side and reservoir side between the new retaining wall and the corner where the floodplain begins) to grade the slope for the upcoming installation of CCMs.

In late October 2009, the contractor performed a cleanup of the Rose Valley Creek area from storms that had occurred on Saturday, October 24, 2009. The observed effects of the storm included:

- Vegetative debris from the Rose Valley Creek sluiceway (adjacent to diversion pumps) and pipes through Rose Valley Creek crossing
- Water overflow onto Chestnut Avenue that poured over the headwall, and
- Erosion on the lower bank of Rose Valley Creek (park side) adjacent to the headwall.

The storm was also observed to have scoured the base of the concrete block retaining wall (adjacent to the headwall). As a result, on November 2, 2009, the contractor began to dismantle and rebuild the concrete block retaining wall. The new wall contained an additional bottom row of concrete blocks to prevent future scouring from the base. Construction of the new retaining wall was completed on November 11, 2009. The approximate dimensions of the wall are 120 ft long (total length), 9 ft high (including the foundation block), and 3 ft wide. On November 17, 2009, concrete was placed at the base of the retaining wall as an extra measure to prevent future scouring along the base of the wall.

On November 4, 2009, the contractor began installation of the CCMs in Rose Valley Creek adjacent to the headwall, and installation of the new stone retaining wall.

On November 6, 2009, the District Manager from the Montgomery County Conservation District was on-site to inspect the site conditions. He was satisfied overall with the erosion and sedimentation

control measures at the site. He suggested a few minor adjustments to the existing berms and silt fences located close to the Tennis Court area.

From November 17 to November 19, concrete was poured to construct a base slab (approximately 8 by 8 ft by 12 inches thick) and a concrete connection column (2 by 2 ft by 6 ft high). The connection column was located between the pre-existing culvert wall and the new culvert wall extension along the right side (facing south) of the culvert.

During December 2009, the site underwent a series of storms that resulted in significant water accumulation and slowed the progress of Phase II activities.

At the end of December 2009, a surveyor crew was on-site to identify the locations and elevations of BPs 2 and 3 along the center of the creek, as well as the respective elevations of the anchor trench along the reservoir side of the creek bank.

January to February 2010

The site underwent a second series of storms in January that significantly slowed the progress of work; in order to make up for lost time and speed up the progress of CCM installation, field activities took place on three consecutive Saturdays (January 16th, 23rd and 30th).

On January 12 and 13, 2010, a survey crew was on-site to extend the center line of the creek from BPs 3 to 4 and beyond.

During February 2010, the site underwent another set of significant storms that deposited several feet of snow over the area. This resulted in closure of the site for a total of 6 days during the month.

On February 3, 2010, a survey crew returned to the site to survey the area beyond BP 4; the Ludgate crew also provided the angle of cut for the CCM mats from BP 4 towards the confluence of the Wissahickon and Rose Valley Creeks.

On February 19, 2010, placement of the CCMs along the creek bed and lower banks of Rose Valley Creek (from the headwall to the crossing) was completed. The sewer access road and the upper bank slopes (park area and the reservoir area) remained to be completed.

March 2010 to April 2010

On March 1, 2010, the contractor placed cement mortar to fill the gaps between the CCMs blocks at BPs 1 through 4 and additional areas along Rose Valley Creek. On March 2, the two large pumps used to divert the stream flow were shut down, and normal flow of Rose Valley Creek resumed (the pumps had been in continuous use since September 2009).

During the last week of March 2010, the site received several inches of rain, resulting in a two-day suspension of major site activities. Once site operations resumed, the contractor placed 48 pieces of CCMs (1,536 square ft) along the sewer access road. The CCMs were smaller in size than those utilized along the streambed and banks. Each section was 8 ft long by 4 ft wide. Placement of CCMs along the sewer access road was completed at the beginning of April.

During the first week of April 2010, the contractor completed construction of a sedimentation retention basin at the southeastern corner of the park (close to the south gate). The berm is approximately 9 ft wide at the base and 3 ft high in the center.

During the second week of April, the contractor began to clear trees, small brush, and miscellaneous debris on the portion of the reservoir berm located behind the residence at the intersection of Maple Street and Chestnut Avenue. After the clearing work had been completed, the area was covered with two layers of straw erosion control mats. On April 20th, a 6-inch-thick seeded compost blanket was sprayed on the area.

During April, the contractor began placing approximately 15 CCMs (4 by 16 ft) between the south gate and the Rose Valley Creek headwall. The work was completed on May 5, 2010.

5.3 DISPOSAL METHODS AND QUANTITIES REMOVED

During the preparation stages of the slope, the bulk (large items) of the ACM debris was collected and placed into roll-off containers for disposal. Based on visual inspection, the organic debris and soil pulled from the slope was handled as suspected ACM and was also sent to the landfill. During the Phase II activities, a total of 69 roll-off containers were sent to the landfill. The combined weight of the 69 containers was 1,072.43 tons.

The combined weight of the roll-off containers is not a direct indication of the amount of asbestos waste sent to the landfill. As stated above, the transported material also included some soil and organic material, which was treated as suspected waste, even though sampling had not occurred to confirm

presence of ACM. In addition, because dust suppression was used during collection and consolidation of the materials, everything was saturated; therefore, the loads were heavier than they would have been otherwise.

6.0 PHASE III DESIGN AND ACTIVITIES

6.1 EROSION AND SEDIMENTATION CONTROL DESIGN

Under Phase III, the reservoir berm section parallel to the Wissahickon Creek was stabilized. The purpose of the stabilization of the reservoir bank was to minimize and/or prevent erosion along the slope and resultant release of asbestos from the site. The activities for Phase III started from survey line WC 16+60 to WC 22+60 and covered almost 600 ft along the east bank of Wissahickon Creek.

Phase III activities included the following steps:

1. Some of the material (mixture of soil and small pieces of ACM) excavated during the Phase II activities was placed (12 to 15 inches thick) along the Phase III area (top of the berm and slope).
2. A 12- to 15-inch-thick layer of clean fill was placed and compacted over the ACM layer along the Phase III area.
3. Six inches of topsoil was placed and compacted over the clean fill along the Phase III area.
4. The entire area (approximately 18,000 square ft) was hydroseeded, and straw erosion control mats were placed along the area to protect the seed from adverse weather conditions and to create a moist environment, for best germination of the seed.

6.2 CHRONOLOGY OF FIELD ACTIVITIES

March 2010

March 17th was the official start date for Phase III activities. ERRS began construction of an approach road into the floodplain area.

On March 22nd the land clearing subcontractor was on-site to start cutting and clearing the trees from the Phase III area; air sampling resumed. Site conditions in the floodplain area were found to be softer than anticipated and required additional work to support heavy equipment; therefore, clearing and grubbing activities were suspended. After consideration of various options, it was decided that wooden mats would be the appropriate solution for constructing the approach road along the Phase III flood plain. On March 31, 2010, site received one truck-load of wooden mats, each 16 ft long and 8 ft wide. The first load contained 12 mats and at the end of the day WRS constructed 96 ft of road.

April 2010

On April 1st the site received two truck-loads of mats (26 mats) that were utilized along the flood plain.

On April 6 and 7 the land clearing subcontractor completed tree cutting operations in the Phase III area. Perimeter and personal air monitoring was performed both days. The subcontractor returned to the site on April 13th with the tub grinder machine to begin grinding all the vegetation. Due to mechanical failure of the equipment, the work was temporarily stopped until repairs were made (the next day). The wood grinding was completed on April 15. Perimeter and personal air sampling was conducted during grinding operations.

May 2010

During this period, ERRS continued the Phase III construction activities by moving, placing, and compacting soils along the Phase III slope prior to hydroseeding the area and installing straw erosion mats.

June 2010

ERRS completed implementation of the Phase III design, including construction of an access ramp from the Phase III floodplain to the pile area. Phase III activities were completed by June 11, 2010.

6.3 DISPOSAL METHODS AND QUANTITIES REMOVED

No ACM material was disposed of off-site during Phase III.

7.0 CHALLENGES ENCOUNTERED

This section describes the challenges encountered during the Phase II and III activities.

PHASE II CHALLENGES

The following challenges were encountered during Phase II construction:

- The stone retaining wall was built twice to ensure the foundation was solid. During a heavy rain event the first wall base was washed out.
- Placement of the CCMs was more difficult than anticipated. Due to the large size of the mats, the height and slope of the banks installation of the mats was difficult.

- A good portion of CCM installation was done over the winter months; therefore, the contractor had to deal with icy conditions every morning, even though the creek was flowing through a pipe.
- At each of the four BPs, the CCMs were cut to ensure the mats would be perpendicular to the centerline of the creek.
- Two hundred feet of the creek bed prior to the Rose Valley crossing was very soft (silt and mud) and did not provide an adequate foundation for placement of the CCMs or for movement of equipment in that area. All the material at this location had to be excavated to provide a firm base for the mats, the area was backfilled with R5 riprap and #57 stone prior to placement of the geotextile fabric and CCMs.

PHASE III CHALLENGES

The following challenges were encountered during Phase III construction:

- Site conditions in the floodplain area were softer than anticipated and required additional work to support heavy equipment. Wooden mats (16 by 8 ft) were used to construct an approach road to the area.
- For construction of the ramp into the pile area, an area on top of the reservoir berm was widened to ensure proper stability during heavy equipment movement within this area. To complete this, a small section of the reservoir (by the old dam) was filled with R5 riprap, over geotextile fabric. The riprap was chocked with 2RC stone and then covered with 2A stone.

8.0 REFERENCES

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9.0 GLOSSARY OF ACRONYMS ANS ABBREVIATIONS

μm	Micrometer
ABS	Activity-based sampling
ACM	Asbestos-containing material
AHERA	Asbestos Hazards Emergency Response Act
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substance and Disease Registry
BoRit	BoRit Asbestos NPL Site
BPs	Bending Points
CCM	Cable concrete mat
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CIC	Community Involvement Coordinator
CMP	Corrugated Metal Pipe
EPA	U. S. Environmental Protection Agency
ERRS	Emergency and Rapid Response Services
ERT	Environmental Response Team
ESA	Environmental Site Assessment
ESC	Erosion and Sedimentation Control
f/cc	Fibers per cubic centimeter
FEMA	Federal Emergency Management Agency
FIT	Field Investigation Team
Ft	Feet
Ft/sec	Feet per second
HDPE	High density polyethylene
KMC	Keasby and Mattison Company
lbs	Pounds
μm	Micrometer
MCHD	Montgomery County Health Department
MCL	Maximum Contaminant Level

MFL	Million fibers per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Adminstration
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PADOH	Pennsylvania Department of Health
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCM	Phase Contrast Microscopy
PCME	Phase Contrast Microscopy Equivalency
PEL	Permissible Exposure Limit
PennDOT	Pennsylvania Department of Transportation
RC	Reinforced concrete
REAC	Response Engineering and Analytical Contract
SARA	Superfund Amendments and Reauthorization Act
SERAS	Scientific Engineering Response and Analytical Services
SI	Site Investigation
START	Superfund Technical Assessment and Response Team
SVOC	Semi-volatile organic compound
TEM	Transmission Electron Microscopy
Tetra Tech	Tetra Tech EM, Inc.
TRW	Technical Review Workgroup
TWA	Time-weighted average
USACE	U. S. Army Corps of Engineers
USGS	United States Geological Survey
VOC	Volatile organic compound
WRS	WRScompass
WVWA	Wissahickon Valley Watershed Association
WVWP	Wissahickon Valley Waterfowl Preserve

APPENDIX A

SITE LOCATION MAP AND SITE SKETCH

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION LOG

APPENDIX B1

PHOTOGRAPHIC DOCUMENTAION LOG PHASE II

APPENDIX B2

PHOTOGRAPHIC DOCUMENTATION LOG PHASE III

APPENDIX C

POST CONSTRUCTION SURVEY DATA (PHASES II & III)